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Knowledge and Preparedness of School Health Nurses in Managing Anaphylaxis within Emirates Health Service

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Abstract

Background: Anaphylaxis is a rapid, life-threatening allergic reaction requiring immediate intervention. In school settings where children with diverse allergies are present, school health nurses are critical first responders. Their ability to recognize symptoms promptly and administer epinephrine significantly reduces the risk of severe outcomes. Despite their central role, knowledge gaps, inconsistent training, and limited resources may compromise effective management. In the United Arab Emirates (UAE), Emirates Health Service (EHS) oversees 398 school nurses across 313 schools, serving a student population where approximately 3% are at risk of anaphylaxis. **Objectives:** The primary objective was to assess the knowledge and response capabilities of school health nurses regarding anaphylaxis recognition and management. Secondary objectives included identifying gaps in training, preparedness, and response, and exploring the influence of demographic factors on nurses' competencies. **Methods:** A cross-sectional survey was conducted among registered school nurses employed by EHS. Data were collected using a validated questionnaire covering demographics, knowledge of anaphylaxis, response capabilities, and training/preparedness. Responses were scored across three domains: Knowledge, Response Capabilities, and Training/Preparedness. Descriptive and inferential statistical analyses were performed using SPSS. Although the minimum required sample size was 179, a total of 252 eligible school health nurses took part, representing 63.3% of the eligible population. This increased the study's statistical power, representativeness, and generalizability. **Results:** A total of 252 nurses participated, predominantly female (79.4%) and mid-career (42% aged 36 - 45 years). Overall, 82.9% demonstrated good knowledge of anaphylaxis, with the highest accuracy in identifying its definition (96.8%) and first-line treatment with epinephrine (96.4%). In the Response Capabili-

ties domain, 73.9% provided preferred responses, although 92.5% reported limited exposure to real cases, and 51.2% did not routinely communicate with parents about allergy management. Training and Preparedness scores were highest, with 93.8% reporting participation in relevant training sessions and drills. A significant association was observed between training/preparedness and response capabilities ($p < 0.001$; Phi = 0.30), with an odds ratio of 19.7 (95% CI: 3.82 - 101.21) indicating substantially higher odds of poor response among less-prepared nurses. **Conclusion:** School health nurses in EHS demonstrate strong theoretical knowledge and self-reported confidence in managing anaphylaxis. However, gaps remain in practical exposure, parent communication, and documentation practices. Structured training programs, ongoing education, and consistent resource availability are essential to enhance preparedness and optimize outcomes in school-based anaphylaxis management.

Keywords

Anaphylaxis, School Health Nurses, Knowledge, Preparedness, Emergency Management, Pediatric Allergic Reactions, School Health Services, Emirates Health Service

1. Introduction

Anaphylaxis is a severe, life-threatening allergic reaction that occurs rapidly and requires immediate medical intervention to prevent serious consequences, including death. In school settings, where children with a wide range of allergies are present, the potential for anaphylactic incidents is a critical concern. School health nurses play a vital role in recognizing, managing, and responding to anaphylaxis, often being the first responders during emergencies. Their ability to quickly identify symptoms and administer appropriate treatments, such as epinephrine, is essential in reducing the risk of severe outcomes [1]. The importance of adequate knowledge and training among school health nurses cannot be overstated, as insufficient preparedness can lead to adverse outcomes [2].

In the United Arab Emirates (UAE), school health nurses employed by EHS are responsible for overseeing the health and safety of students across 313 schools nationwide. EHS coordinates and supervises a team of 398 nurses who manage the well-being of students, including those at risk of anaphylaxis. Approximately 3% of the student population in these schools is at risk of anaphylaxis, with known cases of various types of allergies, highlighting the critical role school health nurses play in managing potential emergencies related to allergies and anaphylaxis. However, despite their essential responsibilities, several studies indicate significant gaps in the knowledge and preparedness of school health nurses in managing anaphylaxis [3]. Inadequate training, inconsistent adherence to protocols, and limited access to resources have been identified as common barriers that may hinder effective responses [4].

To address these concerns, EHS has implemented policies and procedures that enable school nurses to provide prompt emergency treatment in the event of anaphylaxis. The emergency kit, in line with the Resuscitation Council UK recommendations, includes epinephrine injection and salbutamol metered dose inhalers across all schools under EHS. Epinephrine, an alpha-/beta-agonist, stimulates alpha-, beta1-, and beta2-adrenergic receptors, offering pharmacological actions such as relaxation of smooth muscle in the bronchial tree, increased myocardial oxygen consumption by cardiac stimulation, and dilation of skeletal muscle vasculature [5].

Ensuring the availability and proper storage of these medications is critical to provide uninterrupted care during emergency cases. EHS maintains an adequate supply of epinephrine single-use prefilled syringes in various strengths, such as 0.15 mg and 0.3 mg. As a mandatory safety measure, school nurses monitor room temperature daily and conduct monthly inventories of emergency medications. These medications are securely stored under the supervision of the school nurse to prevent unauthorized access.

2. Objectives

2.1. Primary Objective

To assess the level of knowledge and adherence to response capabilities regarding the recognition and management of anaphylaxis among school health nurses in Emirates Health Services.

2.2. Secondary Objectives

1) To assess the level of knowledge among school health nurses regarding anaphylaxis management.

2) To identify gaps in anaphylaxis response capabilities within school settings.

3) To evaluate gaps in training and preparedness for managing anaphylaxis in schools.

4) To explore how demographic factors of school nurses influence their approach to anaphylaxis management in school settings.

3. Research Questions

- What is the extent of school health nurses' knowledge in Emirates Health Services regarding the recognition and management of anaphylaxis?
- What specific gaps exist in the response capabilities, training, and preparedness of school health nurses for managing anaphylaxis?
- Which demographic factors (e.g., years of experience, level of education, training history) impact the knowledge and practices of school health nurses in managing anaphylaxis?

4. Literature Review

Anaphylaxis has become a global problem, with incidence rates for different pop-

ulation groups ranging between 0.05% and 2.0% [6]. Although developmental changes in the diagnosis and management of anaphylaxis have continued to enhance human understanding of the disease, there are grey areas of knowledge that healthcare professionals, including physicians and nurses, who play an essential role in identifying allergy patients, lack adequate knowledge about the acute treatment of anaphylaxis, such as the dose of epinephrine [7] [8].

Knowledge of anaphylaxis among pediatric nurses was investigated by Patnaik *et al.* [9] in India through a survey of pediatric healthcare provider. Although 95.2% of surveyed participants identified epinephrine as the initial therapy, only 22.4% named the correct dose and method of administration. These findings emphasized that the nurses' scores were lower than the physicians' scores in knowledge tests, indicating a need for targeted education for nurses. Similarly, González-Diaz *et al.* [10] assessed the knowledge of healthcare workers in Mexico, and among a total of 266 participants, only 75 (28.7%) passed the knowledge assessment on anaphylaxis management. Furthermore, the present study identified that nurses, unlike allergy specialists, displayed a significant knowledge gap, indicating systemic problems related to training and education.

School health clinics and programs across the world, often led by school nurses, promote the health and well-being of students of all ages within the school environment. School nurses lead and provide essential support in all components of the Whole School, Whole Community, and Whole Child models [11]. Due to the central role of school nurses as key healthcare providers, these professionals need to lead and coordinate anaphylaxis management and prevention in school facilities.

Moreover, anaphylaxis is underdiagnosed and undertreated in emergency departments worldwide. Research has clearly indicated that epinephrine, the first-line drug for anaphylaxis, is frequently under ordered in emergent situations. A study shows that delayed administration of epinephrine in cases of anaphylaxis is associated with an increased risk of hospitalization and poor outcomes [12]. Such results highlight the importance of introducing and following a formal training curriculum with opportunities for practical application to address knowledge-practice discrepancies among healthcare providers.

In the Middle Eastern region, a cross-sectional survey conducted in Madinah, Saudi Arabia, showed that there are serious gaps in managing anaphylaxis among different healthcare providers, as the mean percentage of correct answers for all participants was 60%. The majority stated that they were not trained to identify symptoms or administer epinephrine. Furthermore, the education and training programs they completed may not have provided them with an adequate foundation, or their knowledge may not be up to date. The need for continued education programs is significant [13].

Over the last few years, several strategies have been launched to enhance healthcare professionals' awareness and approaches toward anaphylaxis. Simulation-based training has developed as a helpful tool that significantly improves nurses' confidence and competency. In two operative trials in Australia and the

United States, it was shown that the use of models enabled participants to better detect symptoms of anaphylaxis and comply with treatment measures. Such exercises are beneficial as they provide hands-on experience, allowing participants to practice more appropriate behavior once they are out in the field [14] [15].

Education on the guidelines, which include the WHO Anaphylaxis Guidance and Resuscitation Council UK, has created knowledge among healthcare providers. These guidelines emphasize the early identification of the anaphylactic process, the administration of IM Epinephrine, and follow-up care to prevent relapses. However, there is still inconsistent compliance with these guidelines due to organizational constraints and the lack of the necessary facilities for large-scale implementation [16] [17].

School management of anaphylaxis faces several challenges, including insufficient training and systemic issues. Many of the discussed problems highlight education and training as primary pillars of effective management. Nurses need knowledge and skills regarding early signs of anaphylaxis, epinephrine prescription, and potential complications of biphasic reactions. To address this, continuous and targeted CPD programs could be implemented to help close these gaps [12] [18].

Resource allocation is another significant issue affecting the performance of schools. A report indicated that most schools lack an adequate stock of epinephrine auto injectors necessary for responding to an anaphylactic shock incident. Clearly defined policies and sufficient resources across the nursing field are vital for protecting nurses, enabling them to act professionally without concerns about legal implications [19].

Regarding human resources, a recent study found that 41.2% of sixth-grade schools in Arizona do not employ a licensed nurse. Each school is required to designate at least two staff members for annual training on using Epinephrine Auto-Injectors to qualify for standing orders and maintain an epinephrine supply. The best practice for managing food allergies and anaphylaxis involves having both stock epinephrine and a school nurse [20].

Research suggests that students in schools with part-time nursing staff may not receive the same level of health services as those in schools with full-time nurses, according to recommendations from The American Academy of Pediatrics Council. Full-time nursing services have also been found to be a cost-effective use of public resources, especially given the increasing number of students with chronic health conditions, limited healthcare access, and other medical needs. This underscores the importance of having a full-time nurse in schools to improve the safety of students with food allergies [21].

Other parts include raising community campaigns on anaphylaxis as a key component in enhancing a favorable environment for the management of anaphylaxis. Raising awareness among parents, teachers, and students can encourage the anaphylactic development of a correct management approach, especially regarding anaphylaxis signs and symptoms and effective treatment. Such campaigns

should focus on the importance of epinephrine and educate on which beliefs are myths, as entertaining them leads to delayed intervention [16]. A study revealed that having less than five years of career experience significantly delayed performance in managing students at risk for anaphylaxis. Additionally, improvement was needed in the skills of those with fewer than five years of experience as school nurses in emergency response [21].

5. Methodology

5.1. Research Design

This study employed a cross-sectional quantitative design to achieve its objectives. Data was collected through an online survey, which was distributed electronically via email to school nurses employed under Emirates Health Services (EHS). This approach allowed for efficient and timely data collection from the target population across multiple regions.

5.2. Sample and Setting

The study population was registered school health nurses working in the governmental schools in the United Arab Emirates, and they were employed by Emirates Health Services (EHS). By the time of the research study, EHS had 398 school health nurses in the entire country. The sample size calculated was the minimum number of participants needed to reach sufficient statistical power. During the data collection period, more eligible participants agreed to take part and were included in the final analysis. Including a larger sample improved the statistical power of the study, made the study population more representative, and increased the generalizability of the findings, without changing the study design or methods.

A total of 179 school nurses were employed under EHS in Sharjah, Ajman, Dubai, Ras Al-Khaimah, Fujairah, and Umm Al-Quwain at the time of the study. Using the standard population formula, the required sample size was calculated as 398 nurses, based on the following formula: $n = (p(1 - p))/(A^2/z^2) + (p(1 - p))/(N/R)$.

Where n = sample size; N = accessible population; p = estimated variance in population as a decimal (0.5); A = precision desired expressed in decimal (0.05); Z = based on confidence level 1.6449 for 90%; and R = estimated response rate expressed in decimal (0.75 for 75%). Given N = 398.

Participants were invited to take part in the study via a secure survey link. The invitation included information on the study's purpose, objectives, inclusion and exclusion criteria, and the lead researcher's contact details.

5.3. Inclusion Criteria

- Registered school nurses employed by EHS.
- More than six months of experience in a school setting.
- Willingness to voluntarily participate in the study.

5.4. Exclusion Criteria

- Newly graduated nurses.
- Nurses with less than six months of experience in school settings.
- Assistant nurses and other licensed nurses who were not registered nurses.

Nurses with less than six months of experience or who were newly graduated were excluded because they were undergoing onboarding programs. According to UAE Unified Healthcare Professional Qualifications, assistant nurses and non-registered nurses are not permitted to work in school settings and were therefore excluded.

5.5. Data Collection Instrument

Data were collected using a survey tool titled *"Knowledge and Practices in Response Preparedness Regarding Anaphylaxis"*. The questionnaire was developed by the research team based on a review of relevant literature [19]-[21]. It was divided into two main sections:

5.5.1. Section A: Demographic Data

Included items on age, years of experience, and professional qualifications.

5.5.2. Section B: Knowledge, Preparedness, and Response Capabilities

Knowledge of Anaphylaxis: Definition, signs and symptoms, first-line management, epinephrine administration, and differentiation from other conditions such as vasovagal episodes.

Response Capabilities: Nurses' confidence, role prioritization, and actions taken in managing anaphylaxis in school settings.

Training and Preparedness: Familiarity with school emergency policies, frequency and type of training received, and perceptions of the effectiveness of drills.

Recommendations for Improvement: Open-ended items for nurses to suggest strategies to enhance preparedness and management of anaphylaxis in schools.

6. Validity and Reliability

To establish validity, the questionnaire was reviewed by a panel of experts specializing in anaphylaxis management in school settings. Each item was evaluated for necessity and relevance in assessing reflection and preparedness. The panel confirmed that most items were essential and aligned with the study objectives.

For reliability, the tool was pilot tested with ten school staff nurses. The researcher observed participants as they completed the survey, noting any hesitations, repeated readings, or misunderstandings. Some uncertainty was observed with specific items and formatting, indicating a need for refinement to improve clarity and ensure consistent interpretation among respondents.

7. Timeline

Data collection was conducted over a one-month period, commencing immediately after ethical approval was obtained in April (Ethical Approval Reference No:

MOHAP/DXB-REC/F.M. A/No. 40/2025). Data collection was completed in May, followed by statistical analysis in July. The research paper was finalized upon completion of the analysis.

8. Ethical Considerations and Confidentiality

Ethical principles were strictly observed throughout the study. Participation was entirely voluntary, and digital informed consent was obtained before enrollment. Surveys from participants who did not provide consent were excluded.

Confidentiality was ensured by assigning unique codes to participants, a process clearly explained in the consent form. All data were securely stored and protected until the completion of the dissemination phase. In compliance with research data protection regulations, physical records were destroyed and digital files permanently deleted after the study concluded.

9. Data Analysis

The dataset was downloaded and analyzed using SPSS. Both descriptive and inferential statistical analyses were conducted to summarize and examine study variables.

9.1. Results Respondent: Demographics Data

A total of 252 valid responses were collected and analyzed from six regions: Sharjah, Dubai, Ajman, Umm Al Quwain, Ras Al Khaimah, and Fujairah (Table 1). The highest participation was observed from the Sharjah region, which accounted for 37.7% of the total sample, reflecting stronger engagement compared to other regions.

Table 1. Demographic and professional characteristics of participants (N = 252).

Demographic		Count	Column N %
Region	Sharjah	95	37.7%
	Ajman	52	20.6%
	Fujairah	37	14.7%
	Umm Al Quwain	31	12.3%
	Ras Al Khaimah	28	11.1%
	Dubai	9	3.6%
Gender	Female	200	79.4%
	Male	52	20.6%
	Total	252	100.0%
Age group	36 - 45	106	42.1%
	26 - 35	88	34.9%
	46 - 55	43	17.1%
	25 and less	10	4.0%
	56 and above	5	2.0%

Continued

Experience	2 - 7 years	122	48.4%
	13 years and above	46	18.3%
	8 - 13 years	46	18.3%
	6 months - 1 year	38	15.1%
Hospital experience	Yes	193	76.6%
	No	59	23.4%

With respect to age distribution, the largest proportion of nurses (42%) were between 36 and 45 years, indicating that the workforce predominantly consisted of mid-career professionals. In terms of professional experience, nearly half of the respondents (48.4%) reported having 2 to 7 years of experience, suggesting a predominance of nurses with moderate levels of clinical exposure.

A substantial majority of participants (76.6%) reported having prior hospital-based experience, indicating that most respondents had backgrounds in secondary or tertiary care settings, which may have influenced their clinical competencies and perspectives.

Regarding school clinic staffing, most clinics (75%) were staffed with only one nurse, while the average number of students served per clinic was between 501 and 700 (38.1%).

9.2. Domains

Three key domains were established for analysis: Knowledge, Response Capabilities, and Training and Preparedness. Each domain was developed based on a set of domain-specific items derived from relevant literature.

For all three domains, participant responses were dichotomized, with 1 assigned to correct or preferred answers (as identified through the literature review) and 0 assigned to incorrect or non-preferred answers.

- Knowledge Domain: Comprised of 10 items. Scores were categorized as Poor (0 - 4.9) and Good (5 - 10).
- Response Capabilities Domain: Comprised of 10 items. Scores were categorized as Poor (0 - 4.9) and Good (5 - 10).
- Training and Preparedness Domain: Comprised of 9 items. Scores were categorized as Insufficient (0 - 4.5) and Adequate (4.6 - 9).

This scoring framework enabled consistent measurement and classification of participants' competencies across the three domains, thereby supporting both descriptive and inferential statistical analyses.

Responses that were said to be preferred in the Response Capabilities domain were those that were in accordance with internationally accepted best-practice provisions, such as Resuscitation Council UK. Emergency Anaphylaxis Guideline. These reactions encompassed the in-time identification of symptoms of anaphylaxis, intramuscular injection of epinephrine, emergency response measures, proper documentation of the accident, and communication with parents or guardians af-

ter the event, which was following the event or post-event.

9.3. Knowledge Domain

Analysis of the knowledge domain among participants revealed that 82.9% demonstrated good knowledge overall. Item-level analysis indicated that the highest level of correct responses was observed for the question on the definition of anaphylaxis, with 96.8% answering correctly. Similarly, 96.4% correctly identified adrenaline as the first-line treatment for anaphylaxis. Additionally, 73.8% correctly recognized treatments that are not considered primary interventions in the acute management of anaphylaxis (Figure 1).

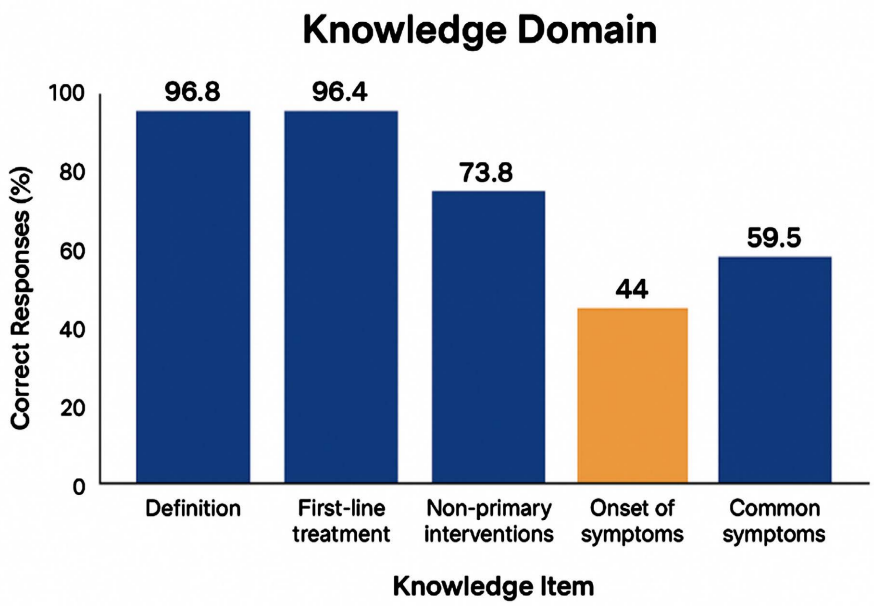

Figure 1. Correct responses across knowledge domain items (N = 252).

Conversely, knowledge gaps were identified in certain areas. The question regarding the onset of symptoms in anaphylaxis, which is important for differentiation from a vasovagal reaction, had the highest proportion of poor responses at 44%. Furthermore, 40.5% of participants answered incorrectly when asked about the common symptoms of anaphylaxis, indicating areas requiring targeted educational reinforcement.

9.4. Response Capabilities Domain Questions

Among the surveyed participants, 73.87% provided the preferred responses across the Response Capabilities domain. A detailed analysis of individual items within this domain revealed that participants reported the highest levels of confidence in recognizing and managing anaphylaxis. Specifically, 98.4% of respondents indicated confidence in identifying the signs and symptoms of anaphylaxis, while 97.2% reported confidence in managing an anaphylactic episode (Figure 2).

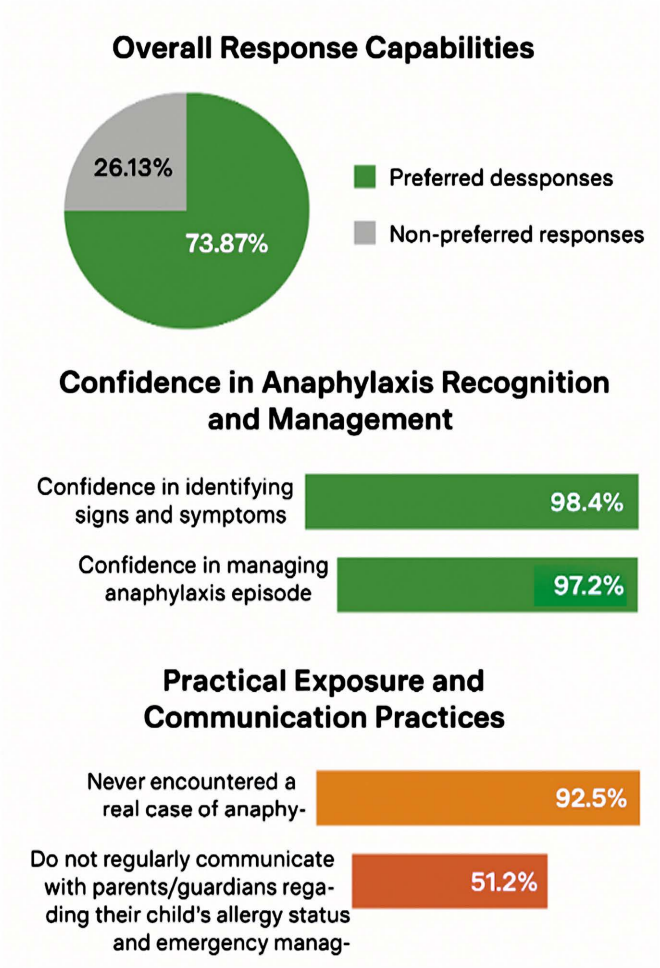

Figure 2. Distribution of responses to items within the response capabilities domain (N = 252).

Despite this high self-reported confidence, practical exposure to real cases was limited. When asked whether they had ever encountered an actual case of anaphylaxis in their school, 92.5% responded negatively. Furthermore, 51.2% of participants reported that they do not regularly communicate with parents or guardians regarding their child's allergy status and emergency management plans (**Figure 2**).

These findings suggest that while school healthcare personnel possess strong theoretical knowledge and confidence in managing anaphylaxis, actual experience and routine engagement with parents about allergy management remain areas for potential improvement.

9.5. Training and Preparedness Domain

Among the participants surveyed, 93.77% provided the preferred responses within the Training and Preparedness domain. A detailed analysis of individual items indicated that 94% of staff had attended training sessions specifically focused on anaphylaxis management in schools, and 90.5% had participated in emergency

response drills for anaphylaxis conducted within their institutions.

Despite these high participation rates, gaps were identified in access to educational resources: 25.4% of respondents reported lacking access to materials or resources to support faculty training. Furthermore, 20.3% of participants indicated unfamiliarity with the documentation and reporting procedures following an anaphylaxis emergency, highlighting an area requiring improvement to ensure comprehensive preparedness

9.6. Domain vs. Demographic

To explore potential associations between demographic characteristics and domain scores, categories were merged where appropriate to facilitate meaningful comparisons. However, given the low number of participants with poor knowledge, this approach had limited impact. Consequently, emphasis was placed on describing observable trends in the crosstabulations within the narrative. While statistical tests were applied wherever feasible, no significant associations were identified between demographic factors and domain outcomes.

Training and Preparedness vs. Response Capabilities

The relationship between participants' training and preparedness and their response capabilities to anaphylaxis was evaluated. Participants with adequate training and preparedness demonstrated a notably higher rate of appropriate responses (98.3%) compared to their less-prepared counterparts. Statistical analysis indicated a significant difference between the groups ($p < 0.001$). The Phi coefficient of 0.30 suggests a moderate association between training/preparedness and response capabilities (Table 2).

Table 2. Association between training and preparedness and response capabilities (P-value).

Training and Preparedness Cat	Insufficient Training/ Preparedness	Count	3	9	12	0.00**
		Row N %	25.0%	75.0%	100.0%	
	Adequate Training/ Preparedness	Count	4	236	240	
		Row N %	1.7%	98.3%	100.0%	
	Total	Count	7	245	252	
		Row N %	2.8%	97.2%	100.0%	
Fisher's Exact Test was performed for P Value						

To further quantify this relationship, a crude odds ratio (OR) was calculated, yielding an OR of 19.7 (95% CI: 3.82 - 101.21). This result indicates that participants with insufficient training/preparedness had approximately 20 times higher odds of exhibiting a poor response compared to those with adequate training. Such a substantial OR aligns with prior literature emphasizing the critical role of structured training in enhancing competence and response effectiveness in healthcare and emergency scenarios.

10. Discussion

The purpose of this study was to evaluate the knowledge and response capabilities of school health nurses in recognizing and managing anaphylaxis. Secondary objectives were to identify gaps in training, preparedness, and response, as well as to examine the impact of demographic factors on nurses' competencies.

This study found that most school nurses (82.9%) demonstrated good overall knowledge of anaphylaxis, particularly regarding its definition (96.8%) and first-line treatment with adrenaline (96.4%). These results align with previous national surveys indicating that school health personnel generally possess strong foundational knowledge of anaphylaxis [1] [3]. Participants also showed good understanding in distinguishing primary versus non-primary interventions (73.8%), consistent with systematic reviews on school nurse preparedness [2].

However, knowledge gaps were noted in recognizing the onset of symptoms (44% incorrect) and identifying common clinical signs (40.5% incorrect), which may delay timely epinephrine administration. These results align with existing evidence indicating that early recognition of symptoms continues to be a challenge, even for healthcare professionals with formal training [10] [12].

Overall, the results emphasize that while school nurses demonstrate strong baseline knowledge regarding definitions and first-line treatments, specific gaps—particularly regarding symptom onset and recognition—require focused attention. Addressing these gaps through structured training and simulation-based reinforcement aligns with global recommendations for improving school-based anaphylaxis preparedness and ultimately safeguarding students at risk [18] [20] [21].

The lack of statistically significant correlations between demographic traits and knowledge, preparedness, or response abilities can be attributed to the availability of institutional training standards in Emirates Health Services. These standardized training needs can reduce differences in variability regarding personal level of experience or education and, therefore, homogenize competencies among members of demographics.

Analysis of the Response Capabilities domain revealed that 73.87% of participants provided preferred responses, indicating generally strong self-reported competence in anaphylaxis management. Participants expressed the highest confidence in recognizing and managing anaphylaxis, with 98.4% confident in identifying symptoms and 97.2% in administering appropriate interventions. These results, align with previous studies, show that school nurses often report high confidence in their ability to respond to allergic emergencies [1] [3].

However, this confidence contrasts with limited practical exposure: 92.5% of respondents had never encountered a real anaphylactic episode in their school. Similarly, routine engagement with parents regarding students' allergy status and individualized emergency plans was suboptimal, with 51.2% reporting irregular communication. These findings mirror broader literature indicating that theoretical knowledge and self-assessed readiness may not always translate into hands-on experience or proactive management practices [4] [21].

The gap between high self-reported confidence and limited hands-on experience points to a clear opportunity for targeted interventions. Implementing simulation-based training and establishing structured communication protocols with parents can reinforce practical skills and preparedness, ensuring school healthcare personnel are equipped to respond effectively, even in the context of infrequent real-life events [14] [15]. Focusing on these areas is essential for bridging the divide between theoretical knowledge, perceived confidence, and actual readiness in school-based anaphylaxis management.

The specified difference between high self-reported confidence and low practical experience has significant policy implications in health services. To overcome this confidence experience gap, it is suggested to have mandatory attendance of the annual competency assessments that involve simulations elements. These evaluations would enable school health nurses to frequently exercise high-risk, low-frequency situations like anaphylaxis so that they can maintain the high level of readiness and consistency between the theoretical and practical performance.

This study demonstrates that school health personnel exhibit high levels of training and preparedness for managing anaphylaxis, with over 90% participating in relevant training sessions and emergency drills. These findings are consistent with prior research emphasizing the importance of structured training in enhancing competence and response effectiveness [1]-[3].

Despite high preparedness, gaps remain in access to educational resources and familiarity with documentation procedures, highlighting areas for improvement [7] [8]. Adequate training was significantly associated with better response capabilities (98.3% appropriate responses; OR = 19.7), supporting literature on the critical role of repeated, structured training and simulation in improving emergency management skills [14] [15].

Interestingly, the study found no significant associations between demographic factors and preparedness or response, suggesting that training exposure is the primary determinant of competency [1] [21]. Overall, these results underscore the need for accessible educational resources, clear reporting protocols, and simulation-based training to ensure effective anaphylaxis management in schools, enhancing both individual and institutional readiness.

11. Conclusion

This study demonstrates that school health nurses under Emirates Health Services generally possess strong knowledge and confidence in recognizing and managing anaphylaxis, with high participation in training sessions and emergency drills. Nevertheless, gaps were identified in symptom recognition, practical exposure to real cases, communication with parents, access to educational resources, and familiarity with documentation procedures. Findings highlight that structured and repeated training significantly enhances response capabilities, emphasizing the need to bridge the gap between theoretical knowledge and practical competence. To strengthen school-based anaphylaxis management, it is recommended to im-

plement regular simulation-based training, establish structured communication protocols with parents, ensure consistent access to updated educational resources and guidelines, reinforce documentation procedures, and conduct periodic audits or refresher sessions. Addressing these areas will enhance preparedness, improve timely and effective responses, and ultimately safeguard the health and well-being of students at risk of anaphylaxis.

12. Limitation of the Study

The cross-sectional design captures data at a single point in time and may not reflect changes from ongoing training. Self-reported surveys could introduce response bias and limited practical exposure to actual anaphylaxis cases restricted assessment of hands-on skills. The focus on nurses employed by Emirates Health Services may limit generalizability to other school settings, and smaller subgroup sizes reduce the ability to detect demographic associations.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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List of Abbreviations

UAE	United Arab Emirates
EHS	Emirates Health Service
UK	United Kingdom
WHO	World Health Organization
IM	Intramuscular
CPD	Continuing Professional Development
REC	Research Ethical Committee
SPSS	Statistical Package for the Social Sciences
OVR	Occurrence Variance Reporting